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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,658	06/23/2005	Richard A Mathies	UCALP031	5388

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EXAMINER	
KIM, YOUNG J	
ART UNIT	PAPER NUMBER
1637	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/540,658	MATHIES ET AL.	
	Examiner	Art Unit	
	Young J. Kim	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 May 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) *27-36* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26 and 37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/13/2006 & 6/5/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election of Group I, consisting of claims 1-26 and 37, in the reply filed on May 18, 2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 27-36 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on May 18, 2007.

Information Disclosure Statement

The IDS's received on February 13, 2006 and June 5, 2006 have been considered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-26, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lagally et al. (Sensors and Actuators B, 2000, vol. 63, pages 138-146; IDS ref# C3[1]) in view of Waller et al. (Applied Environmental Microbiology, 2000, vol. 66, no. 9, pages 4115-4118).

Lagally et al. disclose a monolithic integrated microfluidic DNA amplification and capillary electrophoresis device, for explicit contemplated uses of, "manipulation, amplification, and CE

[1] In the IDS received on June 5, 2006.

separation of submicroliter volumes of DNA" (page 139, 1st column, 3rd paragraph), wherein the device is disclosed as comprising:

a) a PCR chamber (Figure 1(B) on page 140); and

b) a capillary electrophoresis (CE) mechanism (Figure 1 page 140 and page 141, 2nd column, bottom paragarph).

With regard to claims 2 and 12, Lagally et al. disclose that their DNA analysis mechanism comprises PCR and CE (*ut supra*).

With regard to claims 6 and 14, the capillary is etched microchannel for separation and detection of PCR amplicons (page 141, 2nd column, bottom paragraph).

With regard to claims 23, 24, and 26, the device chamber is formed on a glass layer (page 139, 1st column, 1st paragraph), wherein the artisans already disclosed that the glass layer is coupled to a monolithic layer (see Abstract).

With regard to claim 25, the device disclosed by Lagally et al. comprises a plurality of channels (see Figure 1).

While Lagally et al. explicitly contemplate a microfluidic device for PCR and CE analysis, the artisans are not explicit in stating that their device is adapted for conducting immunocapture (claims 3-5, 9, 10, 13, 16-22, and 37).

Waller et al. disclose a method of immunocapture PCR assay for the purpose of detecting a pathogenic species, *Campylobacter jejuni* from food samples (see Abstract).

Waller et al. explicitly disclose a step of binding *Campylobacter* in sample by adding polyclonal anti-*Campylobacter jejuni* IgG to the sample, followed by the purification of the antigen-antibody complex with anti-rabbit IgG-coated Dynabeads (page 4116, 1st column, 1st paragraph).

Waller et al. also disclose the step of lysing the captures cells, so as to remove the *C. jejuni* genomic DNA from the antigen-antibody complex, followed by the amplification of said genomic DNA in a PCR reaction (page 4116, 1st column, 2nd and 3rd paragraph).

Waller et al. evidences the well known practice of cleaning up and concentrating the isolated DNA prior to amplification procedure (page 4116, 1st column, 2nd column).

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Lagally et al. with the teachings of Waller et al., thereby arriving at the invention as claimed for the following reasons.

Initially, the use of microfluidic device has been well-established in the art, the benefits of which would be certainly recognized by one of ordinary skill in the art, such as being able to conduct series of biological reactions on a single device, resulting in efficiency, reduced chances of contamination, human errors, etc.

Additionally, the use of such microfluidic device for the purpose of detecting various target nucleic acids from a sample, be it for a certain medical condition (i.e., cancer) or for the presence of pathogens from samples, is also well known and recognized in the art of miniaturized biological device.

Whether one of ordinary skill in the art, at the time the invention was made would have been motivated to combine the teachings of Lagally et al. with the teachings of Waller et al. is the question in the present formulation of obviousness. It is respectfully submitted that one of ordinary skill in the art would have been certainly motivated to combine the teachings for the following reasons.

Lagally et al. disclose a microfluidic device, which is capable of amplifying and conducting electrophoresis of the amplified products, for the advantage of, "eliminate[ing] sample handling after the initial loading of the sample bus, which increase assay speed and reproducibility and reduces the

possibility of sample contamination from external sources" for the purposes of, "sequencing, forensic and medical assays," (page 145, 1st column, 1st paragraph), creating a "powerful new high-throughput methods for DNA amplification and analysis."

However, the amplification method employed by Lagally et al. is drawn to a PCR amplification, which has recognized deficiencies when it comes to the detection of pathogens, one of which is clearly and explicitly identified by Waller et al.:

> "Due to the prevalence of *Campylobacter* species in the food supply, routine and reliable monitoring for these pathogens is necessary in order to reduce their impact upon human health. Cultivation methods involving enrichment, isolation, and biochemical characterization require 4 to 5 days to comlete...Due to the perishable nature of many food items, a more rapid detection method is necessary to feasibly monitor the potential sources of theses pathogens. For this reason, we have developed an immunocapture PCR method for the detection of *Campylobacter* in foods." (page 4115, 1st column, bottom paragraph)

Hence, one of ordinary skill in the art would have had a clear motivation to fabricate a microfluidic device comprising an assay chamber(s) for conducting immunocapture of pathogens from samples prior to the PCR and capillary electrophoretic analysis, thereby arriving at the invention as claimed.

One of ordinary skill in the art at the time the invention was made would have had a reasonable expectation of success at combining the immunocapture chamber coupled to PCR and CE mechanism, thereby arriving at the claimed device for the following reasons.

The art of microfluidic device has been well-established in the art, which enables an ordinarily skilled artisan to couple a plurality of biochemical reactions, including but not limited to sample purification, enrichment, lysis, amplification, hybridization, etc. (see Zanzucchi et al. patents for example[2]).

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[2] Zanzucchi et al. holds a plurality of patents which demonstrate feasibility of coupling a plurality of biochemical reactions in a microfluidic device, see for example, USPN 5,585,069 which was filed in November 1994.

Hence, given the motivation provided for by Waller et al. which allows one of ordinary skill in the art to detect pathogens in a sample, wherein the artisans explicitly disclose the uses of antibody and bead assisted immunocapture of pathogens, followed by the lysis of the captured pathogens prior to amplification, one of ordinary skill in the art would have had a reasonable expectation of success at creating a chamber or chambers prior to the PCR-CE detection on the microfluidic device of Lagally et al.

Lastly, with regard to providing preconcentration and clean chambers in the device of Lagally et al. would have been obvious in view of the fact that Waller et al. explicitly disclose the step of cleaning up and concentrating the DNA prior to its amplification. In addition, such practice would have been well within the purview of an ordinarily skilled artisan given the fact that PCR would have been more effective by removing the contaminating cell contents when lysing the pathogens in the sample.

Therefore, the invention as claimed is *prima facie* obvious over the cited references.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with

this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-26 and 37 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 19-39 of copending Application No. 10/750,533 (herein, '533 application). Although the conflicting claims are not identical, they are not patentably distinct from each other because the microfluidic device disclosed by '533 application also comprises sample delivery channels (bus) and chambers, for explicit, disclosed mechanism involving PCR and CE integrated thereto (see claim 34). While the claims of '533 application is silent with regard to the use of the device for the purpose of pathogen detection as well an immunocapture chamber, said modification is deemed obvious in view of the teachings of Waller et al. as discussed in the above rejection.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

No claims are allowed.

Inquiries

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Young J. Kim whose telephone number is (571) 272-0785. The Examiner is on flex-time schedule and can best be reached from 8:30 a.m. to 4:30 p.m (M-W and F). The Examiner can also be reached via e-mail to Young.Kim@uspto.gov. However, the office cannot

guarantee security through the e-mail system nor should official papers be transmitted through this route.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Dr. Gary Benzion, can be reached at (571) 272-0782.

Papers related to this application may be submitted to Art Unit 1637 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1156 OG 61 (November 16, 1993) and 1157 OG 94 (December 28, 1993) (see 37 CFR 1.6(d)). NOTE: If applicant does submit a paper by FAX, the original copy should be retained by applicant or applicant's representative. NO DUPLICATE COPIES SHOULD BE SUBMITTED, so as to avoid the processing of duplicate papers in the Office. All official documents must be sent to the Official Tech Center Fax number: (571) 273-8300. For Unofficial documents, faxes can be sent directly to the Examiner at (571) 273-0785. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (571) 272-1600.

Young J. Kim
Primary Examiner
Art Unit 1637
6/18/2007

YOUNG J. KIM
PRIMARY EXAMINER

YJK